

06/09/2006

Bank: (Flight Engineer)

Airman Knowledge Test Question Bank

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1. T33 FEX

Transonic airspeeds are considered to be from

- A) Mach 0.5 to 0.75.
- B) Mach 0.75 to 1.2.
- C) Mach 0.75 to 2.0.

2. T33 FEX

Mach number is commonly defined as the

- A) ratio of true airspeed to the speed of sound.
- B) ratio of equivalent airspeed to the speed of sound.
- C) speed of sound under conditions of standard pressure and temperature.

3. T33 FEX

The speed at which the airflow over the wing first reaches the speed of sound is known as the

- A) Reynolds number.
- B) transonic index.
- C) critical Mach number.

4. T57 FEX

The purpose of sweeping wings back approximately 30° to 35° is to

- A) minimize dutch roll.
- B) reduce high-speed drag.
- C) provide aileron control when the root of the wing approaches the critical angle of attack.

5. T33 FEX

Shock-induced separation of airflow occurring symmetrically near the wing root of a sweptback wing may result in

- A) severe porpoising due to an attempt to recover control while under reverse command.

- B) a high-speed stall and sudden pitchup due to the center of pressure moving forward on the wing.
C) a severe diving moment, due to the center of pressure moving aft on the wing and a decrease of downwash on the horizontal tail.

6. W06 FEX

An airplane is climbing at Mach .78. The true airspeed will

- A) increase with altitude.
B) increase as pressure decreases.
C) decrease as the temperature decreases.

7. W07 FEX

Which is an advantage of flying a jet at high altitudes?

- A) Lower temperatures increase engine efficiency.
B) Thrust increases as the density of the air decreases.
C) Lower engine RPM's will result in decreased specific fuel consumption.

8. T30 FEX

When will the static air temperature equal ram air temperature?

- A) When the airplane is stationary.
B) At airplane speeds above Mach 0.30.
C) When the ram air temperature is sensed by a Lewis Flush Bulb.

9. W07 FEX

Which factor is most significant when determining the optimum cruise altitude available?

- A) Winds aloft and temperature forecast.
B) Fuel requirement to climb to altitude.
C) Gross weight of the airplane at the beginning of the cruise.

10. S69 FEX

(Refer to figure 6.) An airplane with a cabin altitude of 8,000 feet experiences a cracked inner window and must decrease the cabin pressure differential from 8.6 to 5.0 PSI. To which altitude must the airplane descend to maintain the same cabin altitude?

- A) FL 200.
B) FL 220.
C) FL 230.

11. S69 FEX

(Refer to figure 6.) A descent is made from FL 340 (cabin altitude 5,200 feet) to FL 320. What will be the approximate cabin altitude after the descent if the same cabin pressure differential is maintained?

- A) 3,200 feet.
- B) 4,300 feet.
- C) 5,000 feet.

12. W06 FEX

Which is a characteristic of the constant Mach cruise control procedure?

- A) EPR is increased as aircraft weight decreases.
- B) Thrust is reduced as aircraft weight decreases.
- C) True airspeed decreases as the outside air temperature (OAT) increases.

13. T31 FEX

(Refer to figure 13.) Determine the go-around EPR's for these conditions.

Pressure altitude	1,000 ft
TAT	0 °C
A/C bleeds	No. 2 and 3 ON
	No. 1 OFF
Anti-ice	Eng. ON

- A) Eng. 1, 2.12; Eng. 2, 2.15; Eng. 3, 2.12.
- B) Eng. 1, 2.16; Eng. 2, 2.11; Eng. 3, 2.16.
- C) Eng. 1, 2.16; Eng. 2, 2.08; Eng. 3, 2.12.

14. T31 FEX

(Refer to figures 14 and 15.) Determine the maximum takeoff power settings.

Pressure altitude	Sea Level
OAT	+15 °C
A/C bleed	No. 1 and 2 OFF
	No. 3 ON
Eng. anti-ice	OFF
No. 2 Eng. EPR gauge	Inoperative

- A) Eng. 1, 2.12; Eng. 2, 98.2; Eng. 3, 2.10.
- B) Eng. 1, 2.10; Eng. 2, 92.7; Eng. 3, 2.14.
- C) Eng. 1, 2.14; Eng. 2, 96.9; Eng. 3, 2.10.

15. T31 FEX

An airplane has been cruising for 2 hours and 15 minutes at a speed of Mach .82. Total fuel consumed during this period has been 27,250 pounds. If Mach 1.0 is 595 knots, what has been the NM per 1,000 pounds of fuel?

- A) 40.3 NM/1,000 pounds.
- B) 43.7 NM/1,000 pounds.
- C) 46.4 NM/1,000 pounds.

16. T31 FEX

(Refer to figure 6.) The maximum temperature limitation for takeoff is ISA +34 °C. Which is the highest temperature that will allow a takeoff from a 7,000-foot pressure altitude airport?

- A) +87 °F.
- B) +91 °F.
- C) +94 °F.

17. T31 FEX

(Refer to figure 6.) The maximum temperature limitation for takeoff is ISA +34 °C. Which is the highest temperature that will allow a takeoff from an 8,000-foot pressure altitude airport?

- A) +87 °F.
- B) +91 °F.
- C) +94 °F.

18. S78 FEX

What is the lowest ambient temperature that engine ice is likely to form?

- A) 0 °C.
- B) +5 °F.
- C) -40 °F.

19. S78 FEX

What is the highest ambient temperature that ice is likely to form in the engine inlet?

- A) Visibly moist air and +45 °F.
- B) Visibly moist air and +70 °F.
- C) Relatively dry air and +32 °F.

20. S78 FEX

What is the most prevalent condition for engine icing?

- A) High-engine speed in flight.
- B) Low-engine speed on the ground.
- C) High-engine speed on the ground.

21. S78 FEX

Why will the EPR indication increase falsely if the P_t probe at the engine nose dome opening ices up?

- A) The P_t probe vent will act as a P_s probe.
- B) Anti-ice air pressurizes the nose dome and the vent hole causing an increase in EPR.
- C) The reduced inlet area causes pressure to increase, and magnifies the influence of ram air pressure.

22. S78 FEX

Why is engine anti-ice not normally activated below an ambient temperature of +5 °F?

- A) The air is too dry to form ice.
- B) Engine anti-ice will increase the intake temperature causing compressor ice to form.
- C) Thermal shock can severely damage the engine or even cause the engine to fail completely.

23. S24 FEX

A turbojet aircraft is equipped with heated inlet ducts and airfoil leading edges. When is this type of anti-icing system usually activated during flight?

- A) It is operated continuously while in flight.
- B) At all times when the OAT is below freezing.
- C) Whenever icing conditions are first encountered or are expected to occur.

24. S78 FEX

What will cause the EPR indication to decrease falsely if the P_t probe at the engine nose dome is iced closed?

- A) The P_t probe vent will act as a P_s probe.
- B) Anti-ice air will pressurize the nose dome and the vent hole causing a decrease in EPR.
- C) The reduced inlet area causes pressure to increase, and magnifies the influence of ram air pressure.

25. T34 FEX

Which statement is correct when applying liquid rain repellent?

- A) Begin application as soon as rain begins, to form a barrier between the rain and the windshield.
- B) Apply rain repellent first, then activate the windshield wipers to spread the repellent.
- C) The number of times the repellent is applied is determined by the intensity of the rain.

26. S66 FEX

What type voltage will be produced if an ac generator is being driven, but there is no field excitation?

- A) Real voltage.

B) Residual voltage.

C) Reactive voltage.

27. T56 FEX

The purpose of a constant speed drive for an ac generator is to

A) control field strength.

B) regulate generator voltage.

C) maintain a uniform frequency.

28. S66 FEX

The purpose of a KVAR meter is to

A) display the generator frequency.

B) measure the work being performed.

C) indicate how hard the generator is working to produce the power being used.

29. T72 FEX

Which are protective functions of an ac generator control unit?

A) Open phase, underexcitation, and overvoltage.

B) Undervoltage, differential fault, and manual paralleling.

C) Generator underspeed and bus-tie circuit-breaker automatic closing.

30. S66 FEX

The purpose of a KW meter is to

A) display the generator frequency.

B) measure the work being performed.

C) indicate how hard the generator is working to produce the power being used.

31. S66 FEX

How are airplane ac generators rated?

A) Volts.

B) Kilowatts (KW).

C) Kilovolt-amps (KVA).

32. S31 FEX

The air-cycle cooling system produces cold air by

A) passing heated air through a compressor.

B) passing air through an expansion turbine and extracting heat energy.

C) passing air through cooling coils that contain a volume of refrigerant.

33. S31 FEX

Which components make up the basic air-cycle cooling system?

- A) Heaters, coolers, and compressor.
- B) Ram air source, compressors, and engine bleeds.
- C) A source of compressed air, heat exchangers, and a turbine.

34. S31 FEX

Which component of an air-cycle cooling system undergoes a pressure and temperature drop of air during operation?

- A) Expansion turbine.
- B) Primary heat exchanger.
- C) Refrigeration bypass valve.

35. T49 FEX

What is the indication of a thermal discharge of a gaseous oxygen system?

- A) The blowout disk is ruptured.
- B) The pressure gauge indicates zero.
- C) The heat sensitive paint marks change from white to black.

36. T49 FEX

What identifies an expended chemical oxygen generator?

- A) The direct reading pressure gauge indicates zero.
- B) The heat sensitive paint mark has changed from white to black.
- C) The green plastic disk is missing from the common discharge indicator.

37. S69 FEX

The optical smoke detectors on the flight engineer panel correspond to

- A) light beam responses to cargo hold air samples.
- B) closed circuit mini-cam installations in the cargo hold.
- C) translucent spotter tubes providing a view of the cargo holds.

38. T51 FEX

What is used primarily as a propellant for installed fire extinguishing systems?

- A) CO₂.
- B) Nitrogen.
- C) Hydrogen peroxide.

39. S27 FEX

(Refer to figure 4.) A red disc is missing from port 3, and a yellow disc is missing from port 1. What does this indicate?

- A) Both bottles have been normally discharged, but into different engines.
- B) Bottle 1 has been normally discharged and bottle 2 has been thermally discharged.
- C) Bottle 2 has been normally discharged and bottle 1 has been thermally discharged.

40. T35 FEX

Airplanes equipped with both inboard and outboard ailerons normally use the outboard ailerons only during

- A) low-speed operations.
- B) high-speed operations.
- C) low-altitude operations.

41. T57 FEX

Why do some airplanes equipped with inboard/outboard ailerons use the outboards for slow-flight speeds only?

- A) Aerodynamic loads on the outboard ailerons tend to twist the wingtips at high speeds.
- B) Increased surface area provides greater controllability with flap extension.
- C) Locking out the outboard ailerons in high speed flight provides variable flight control feel.

42. S55 FEX

How does an aileron balance panel function?

- A) A weight is installed ahead of the hinge line to counteract flight loads.
- B) The aileron is extended ahead of the hinge line so the airstream will help move the surface.
- C) Pressure changes created by the aileron deflect a hinged panel in a compartment ahead of the aileron.

43. T45 FEX

When are outboard ailerons normally used?

- A) Low-speed flight.
- B) High-speed flight.
- C) Low-speed and high-speed flight.

44. T45 FEX

When are inboard ailerons normally used?

- A) Low-speed flight only.
- B) High-speed flight only.
- C) Low-speed and high-speed flight.

45. T34 FEX

The use of a slot in the leading edge of the wing enables an airplane to land at a slower speed because it

- A) changes the camber of the wing.
- B) delays the stall to a higher angle of attack.
- C) decelerates the upper surface boundary layer air.

46. S55 FEX

A purpose of wing mounted vortex generators is to

- A) prevent shock induced separation of air from the wing.
- B) increase the onset of drag divergence and aid in aileron effectiveness at high speed.
- C) break the airflow over the wing so the stall will progress from the root out to the tip of the wing.

47. S22 FEX

The purpose of vortex generators mounted on the vertical fin upstream of the rudder is to

- A) decrease drag at slow airspeeds.
- B) maintain rudder effectiveness at high speed.
- C) prevent flow separation over the rudder during extreme angles of yaw.

48. T45 FEX

A purpose of leading edge slats on high performance wings is to

- A) decrease lift at relatively slow speeds.
- B) improve aileron control during low angles of attack.
- C) direct air from the high-pressure area under the leading edge along the top of the wing.

49. S55 FEX

Which direction from the primary control surface does an antiservo tab move?

- A) Same direction.
- B) Opposite direction.
- C) Remains fixed for all positions.

50. S55 FEX

Which direction from the primary control surface does a servo tab move?

- A) Same direction.
- B) Opposite direction.
- C) Remains fixed for all positions.

51. T34 FEX

What is a disadvantage of wing mounted vortex generators?

- A) Drag is increased slightly at slow airspeeds.
- B) Parasite drag increases significantly at high airspeeds.
- C) Shock induced flow separation from vortex generators increases control surface buffet.

52. T45 FEX

A purpose of leading edge slats on high performance wings is to

- A) increase lift at relative slow speeds.
- B) improve aileron control during low angles of attack.
- C) direct air from the low-pressure area under the leading edge along the top of the wing.

53. T45 FEX

The purpose of a servo tab is to

- A) move the flight controls in the event of manual reversion.
- B) reduce control forces by deflecting in the proper direction to move a primary flight control.
- C) prevent a control surface from moving to a full deflection position due to aerodynamic forces.

54. T45 FEX

A purpose of flight spoilers is to

- A) increase the camber of the wing.
- B) reduce lift without increasing airspeed.
- C) direct airflow over the top of the wing at high angles of attack.

55. T45 FEX

The purpose of an antiservo tab is to

- A) move the flight controls in the event of manual reversion.
- B) reduce control forces by deflecting in the proper direction to move a primary flight control.
- C) prevent a control surface from moving to a full deflection position due to aerodynamic forces.

56. S67 FEX

Total air temperature is equal to

- A) OAT corrected for altitude.
- B) ambient temperature minus the ram rise from adiabatic compression of the boundary layer.
- C) ram air temperature when the recovery factor of the temperature sensor is equal to 100 percent.

57. S68 FEX

Which are examples of wide cut turbine fuels?

- A) Jet B and JP-4.
- B) Jet A and JP-4.
- C) Jet A and Jet A-1.

58. S04 FEX

What is the difference between turbine fuel Jet A and Jet A-1?

- A) Jet A is made for operation at extremely low temperatures.
- B) Jet A-1 is made for operation at extremely low temperatures.
- C) Jet A is for use in older turbine aircraft, while Jet A-1 is formulated for the newest aircraft.

59. S68 FEX

Which indicator is used to determine if conditions are conducive to formation of ice in the fuel?

- A) OAT.
- B) Fuel temperature.
- C) Fuel pressure warning system.

60. S68 FEX

Which is a means of controlling the fuel temperature on turbojet-powered airplanes?

- A) Electrically heated fuel filters.
- B) Engine bleed air routed to a heat exchanger.
- C) Fuel filters heated by engine lubricating oil.

61. S68 FEX

The purpose of a fuel temperature indicator is to

- A) determine if fuel temperatures are conducive to ice crystal formation.
- B) determine if fuel temperatures are beyond limits for proper combustion.
- C) correct fuel quantity indicator readings when the temperature is not standard.

62. T24 FEX

Which is the most critical parameter for a turbine engine during starting?

- A) Oil pressure.
- B) EGT.
- C) Starter engagement time.

63. S76 FEX

Fuel heaters should not be operated on takeoff, approach, or go-around because the

- A) EPR will decrease significantly.
- B) engine may flameout from fuel vaporization.

C) oil temperature will increase significantly as fuel temperatures rise within the oil cooler.

64. S63 FEX

An advantage of Skydrol is that it

- A) is resistant to water contamination.
- B) has a wide operating temperature range.
- C) is compatible with vegetable-base hydraulic fluid.

65. S63 FEX

A disadvantage of Skydrol is that

- A) it is incompatible with synthetic-base fluid.
- B) sustained operations below -40 °C should be avoided.
- C) it will break down the insulation on some electrical wiring.

66. S64 FEX

The purpose of chines on tires is to

- A) increase traction on snow or ice covered runways.
- B) reduce the tendency to hydroplane on wet runways.
- C) deflect water or slush away from the engine intakes.

67. S64 FEX

Where should the chines be located for a dual nosewheel installation?

- A) One on each side of the tires.
- B) On the inside of the tires only.
- C) On the outside of the tires only.

68. S64 FEX

The main purpose of a brake deboosters is to

- A) provide pneumatic braking.
- B) reduce the hydraulic pressure.
- C) decrease the volume of fluid going to the brakes.

69. S64 FEX

One purpose of a brake deboosters is to

- A) provide emergency braking.
- B) increase the hydraulic pressure.
- C) increase the volume of fluid going to the brakes.

70. T02 FEX

The speed (RPM or percent) of the low pressure compressor of a dual compressor engine is referred to as

- A) N_1 .
- B) N_2 .
- C) N_3 .

71. S46 FEX

Which difference does engine pressure ratio measure?

- A) Uncorrected compressor inlet pressure and turbine discharge pressure.
- B) Compressor inlet total pressure corrected for inlet duct loss and turbine discharge total pressure.
- C) Compressor outlet total pressure corrected for temperature and turbine discharge total pressure.

72. S46 FEX

Why is 36,000 feet considered an optimum altitude for most airplanes during long range flights?

- A) The range between high and low speed Mach buffet decreases rapidly above this altitude.
- B) Decreased aerodynamic drag is not as great as the decrease in engine thrust above this altitude.
- C) Above this altitude the increase in drag from high angles of attack is greater than the increase in engine

73. S79 FEX

During starting, what should prevent the engine from driving a pneumatic starter to burst speed?

- A) Drive shaft shear point.
- B) Sprag clutch assembly.
- C) Design of the starter turbine nozzle vanes which causes choking.

74. S79 FEX

During engine start, closing of the start air valve may be verified by

- A) engine RPM stabilizing at idle.
- B) air manifold pressure increasing slightly.
- C) air manifold pressure decreasing slightly.

75. S46 FEX

In a dual axial-flow compressor system the first stage turbine drives the

- A) N_1 compressor.
- B) N_2 compressor.

C) N_1 and N_2 compressors.

76. T24 FEX

It is important to monitor the EGT when starting the engines to prevent

A) hot section burnout or metal distortion.

B) compressor temperature limits from being exceeded.

C) dangerous gas temperatures and velocities when accelerating to idle from injuring personnel or damaging

77. T04 FEX

Why should turbine engines normally be operated at idle for a period of time before shutdown?

A) The turbine case cools faster and may shrink down and seize the turbine blades.

B) Rapid cooling of the compressor section may cause cracking of compressor blades.

C) Temperature reduction and stabilization prevents a hot combustion chamber from igniting residual fuel.

78. S46 FEX

The speed (RPM or percent) of the high pressure compressor of a dual compressor engine is referred to as

A) N_1 .

B) N_2 .

C) N_3 .

79. T03 FEX

(Refer to figure 7.) The internal engine temperature will be the lowest at which location?

A) Location 3.

B) Location 4.

C) Location 6.

80. T03 FEX

(Refer to figure 7.) The internal engine pressure will be the lowest at which location?

A) Location 4.

B) Location 5.

C) Location 6.

81. T03 FEX

(Refer to figure 7.) The internal engine pressure will be the highest at which location?

- A) Location 4.
- B) Location 5.
- C) Location 6.

82. T19 FEX

The primary purpose of an oil-to-fuel heat exchanger is to

- A) cool the oil.
- B) heat the fuel.
- C) decrease oil viscosity.

83. S46 FEX

(Refer to figure 8.) Where is the engine high pressure compressor located?

- A) Location 1.
- B) Location 2.
- C) Location 3.

84. S46 FEX

How does a change in altitude affect the low pressure compressor speed of a triple-spool engine?

- A) The compressor will speed up as altitude is increased.
- B) The fuel control will maintain a constant compressor speed.
- C) The compressor speed will decrease as the atmosphere becomes less dense.

85. S73 FEX

(Refer to figure 9.) Power to drive the N_1 compressor comes from the turbine at which location?

- A) Location 5.
- B) Location 8.
- C) Location 9.

86. S81 FEX

(Refer to figure 10.) What is the indicated speed of the engine low pressure compressor?

- A) 94.1 percent.
- B) 96.5 percent.
- C) 97.0 percent.

87. S46 FEX

(Refer to figure 8.) Where is the engine low-pressure turbine located?

- A) Location 2.
- B) Location 3.

C) Location 4.

88. S46 FEX

On most engines ram recovery occurs above

- A) 60 knots.
- B) 100 knots.
- C) 140 knots.

89. S72 FEX

The function of the nozzle diaphragm located on the upstream side of the turbine wheel is to

- A) increase the pressure of the exhaust mass.
- B) increase the velocity of the heated gases flowing past the nozzle diaphragm.
- C) decrease the velocity of the heated gases flowing past the nozzle diaphragm.

90. S72 FEX

The purpose of the diffuser section in a turbine engine is to

- A) convert pressure to velocity.
- B) increase pressure and reduce velocity.
- C) reduce pressure and increase velocity.

91. S83 FEX

Why should shutting an engine down by turning the boost pumps off and closing the airplane's fuel valve be used during emergencies only?

- A) During a subsequent start the engine driven fuel pump may cavitate causing a hung start.
- B) The fuel system's service life will be decreased because fuel wetted components will not be lubricated.
- C) The 30 to 60 seconds for the fuel to clear the fuel lines from the firewall to the fuel controller is too long for normal shutdowns.

92. S49 FEX

Which components in a turbine engine aid in stabilization of the compressor during low power operations?

- A) Stator vanes.
- B) Bleed air valves.
- C) Pressurization and dump valves.

93. S83 FEX

If a turbine engine catches fire internally during the start cycle, what initial action should be taken?

- A) Secure all switches and leave the airplane.

- B) Shut off the fuel and continue motoring the starter.
- C) Discharge CO₂ into the inlet duct while continuing to motor the engine.

94. T03 FEX

(Refer to figure 7.) The internal engine temperature will be the highest at which location?

- A) Location 3.
- B) Location 4.
- C) Location 6.

95. S81 FEX

Which engine instrument is most likely to show an elevated reading if the turbine wheel is damaged?

- A) N₂.
- B) EPR.
- C) EGT or TIT.

96. S81 FEX

What condition will cause a false, high EPR indication, in flight or on the ground?

- A) Bleed valve stuck open.
- B) Ice in the inlet pressure lines.
- C) Loose turbine discharge pressure lines.

97. S81 FEX

What condition will cause a high EGT, W_f, and RPM with a normal EPR indication, at all power settings?

- A) FOD.
- B) Bleed valve stuck open.
- C) Ice in the inlet pressure lines.

98. J19 FEX

What does declaring minimum fuel to ATC imply?

- A) Traffic priority is needed to the destination airport.
- B) Emergency handling is required to the nearest useable airport.
- C) An emergency situation is possible should an undue delay occur.

99. T50 FEX

What information does a Mach meter present?

- A) The ratio of airplane true airspeed to the speed of sound.

- B) The ratio of airplane indicated airspeed to the speed of sound.
- C) The ratio of airplane equivalent airspeed, corrected for installation error, to the speed of sound.

100. D20 FEX

Each crewmember shall have available for individual use on each flight a

- A) quick-donning type oxygen mask.
- B) flashlight in good working order.
- C) hand fire extinguisher suitable for extinguishing Class A, B, and C fires.

101. A07 FEX

What minimum amount of fuel should remain for turbine-powered airplanes after jettisoning with the main fuel control? Forty-five minutes at

- A) 75 percent maximum continuous power.
- B) maximum continuous power with the critical engine inoperative.
- C) maximum range speed after climbing from sea level to 10,000 feet.

102. J11 FEX

What altitude information is transmitted by MODE C of the transponder?

- A) Pilot's indicated altitude.
- B) Altitude in 10-foot increments.
- C) Altitude without barometric pressure correction.

103. J13 FEX

What is the significance of a flashing red ATCT light gun signal?

- A) Vehicles or personnel should clear the taxiway.
- B) Aircraft in flight should exercise extreme caution.
- C) Aircraft on the ground should return to their starting point on the airport.

104. I29 FEX

An in-flight condition necessary for structural icing to form is

- A) visible moisture.
- B) stratiform clouds.
- C) cirrostratus clouds.

105. H124 FEX

Before a cargo change is made, the following is known about an airplane:

Aircraft weight	250,000 lb
CG	30.5 percent of MAC

Length of MAC Station 763.0 to 1035.3

If 5,000 pounds of cargo is removed from an average location of Station 1010.0, what is the new CG relative to MAC?

- A) 27.5 percent.
- B) 29.3 percent.
- C) 31.7 percent.

106. H124 FEX

The gross weight of the airplane is 155,000 pounds. How much weight must be moved from Station 1028.0 to Station 582.0 to move the CG forward 1.2 inches?

- A) 352 pounds.
- B) 418 pounds.
- C) 516 pounds.

107. H124 FEX

What minimum weight of cargo must be shifted from the aft to the forward compartment to bring the CG within limits?

Total weight	165,000 lb
MAC	Station 860.2 to 1040.9
CG	34.0 percent of MAC
Aft CG limit	32.0 percent of MAC
Cargo centroids:	
	Fwd 582 in
	Aft 1028 in

- A) 740 pounds.
- B) 1,032 pounds.
- C) 1,338 pounds.

108. W12 FEX

Compared to a no-wind condition, what effect would a 20 knot headwind component have on takeoff performance?

- A) The effect of wind on initial acceleration will result in a longer takeoff roll.
- B) The airplane will reach critical engine failure indicated airspeed at a lower groundspeed.
- C) Critical engine failure speed and actual groundspeed will be the same as in a zero-wind condition.

109. W04 FEX

The true airspeed at which an airplane stalls varies with

- A) load factor and angle of attack.

- B) load factor, weight, and density altitude.
- C) density altitude, weight, and angle of attack.

110. T35 FEX

An airplane is in equilibrium when

- A) there are no accelerations and the airplane continues in steady flight.
- B) the airplane is disturbed from its flightpath and it will return without control use.
- C) the airplane has neither the tendency to continue or return from disturbance displacement.

111. W05 FEX

The angle of attack which produces the highest L/D ratio

- A) increases as weight or altitude is increased.
- B) remains constant regardless of weight or altitude.
- C) remains constant as altitude is changed, but decreases as weight is reduced.

112. T33 FEX

What effect will decreasing air density have on lift and drag?

- A) Lift and drag will decrease.
- B) Lift will increase and drag will decrease.
- C) Lift will decrease and drag will increase.

113. W02 FEX

True airspeed is determined by correcting

- A) indicated airspeed for density altitude.
- B) calibrated airspeed for nonstandard temperature and altitude.
- C) equivalent airspeed for the air-density variation from the standard value at sea level.

114. S69 FEX

(Refer to figure 6.) The cabin pressure altitude is 6,000 feet and the airplane altitude is FL 180. What is the differential pressure?

- A) 4.44 PSI.
- B) 4.71 PSI.
- C) 5.46 PSI.

115. S69 FEX

(Refer to figure 6.) The cabin pressure differential is 5.46 PSI and the airplane altitude is FL 200. What is the cabin altitude?

- A) 3,200 feet.

- B) 4,400 feet.
- C) 5,000 feet.

116.
T31
FEX

(Refer to figure 30.) How much fuel remains after dumping under operating conditions No. 1?

- A) 710 pounds.
- B) 2,917 pounds.
- C) 3,294 pounds.

117.
T31
FEX

(Refer to figures 22 and 23.) What is the takeoff power setting under operating conditions No. 1?

- A) 234 BMEP.
- B) 204 BMEP.
- C) 59.5 inches manifold pressure.

118.
T31
FEX

(Refer to figure 29.) How much fuel remains after operating under these conditions?

Number of engines	4		
Beginning total weight	95,720 lb		
Zero fuel weight	64,850 lb		
BHP	Pressure	Alt.	Spark
1,200	17,000 ft		T/O & CL
1,100	19,000 ft		Cruise
1,000	19,000 ft		Cruise
			Time
			18 min
			1 hr 20 min
			1 hr 10 min

- A) 2,040 gallons.
- B) 3,874 gallons.
- C) 5,145 gallons.

119.
W07
FEX

For an airplane with a given gross weight and constant cruise speed, what is the relationship between fuel flow, temperature, and altitude? Fuel flow is higher when

- A) both temperature and altitude are decreased.
- B) both temperature and altitude are increased.
- C) temperature is increased and altitude is decreased.

120.
T12
FEX

Which is an indication of carburetor ice?

- A) Decrease in propeller RPM.

- B) Manifold pressure (MAP) drop.
- C) Backfiring, which is caused by a rich mixture.

121. T12 FEX

Which atmospheric condition is the most conducive to throttle ice with partial power?

- A) High aridity and freezing temperatures.
- B) Rain with the ambient temperature a few degrees above freezing.
- C) High humidity and an ambient temperature between 50 °F and 60 °F.

122. T66 FEX

What are the characteristics of the electrolyte in a nickel-cadmium battery?

- A) Noncorrosive.
- B) Much like household lye and will cause severe burns.
- C) Harmless compared to the electrolyte in a lead-acid battery.

123. T66 FEX

What type of electrolyte is contained in a lead-acid battery?

- A) Boric acid.
- B) Sulfuric acid.
- C) Potassium hydroxide.

124. S66 FEX

What disconnects a generator from the system bus when generator voltage is lower than battery voltage?

- A) Voltage regulator.
- B) Paralleling circuit.
- C) Reverse-current relay.3/8/94 chg ref from S51 to S66. P-531.

125. S66 FEX

The purpose of a reverse-current relay is to

- A) prevent one generator from driving another generator.
- B) increase or decrease the voltage of a generator so it carries its share.
- C) disconnect the generator from the main bus when generator voltage drops below battery voltage.3/8/94 Chg ref. from S51 to S66. P-530.

126. T75 FEX

What is a feature of an electromagnetic-type circuit breaker?

- A) It resets automatically.

- B) It may be reset immediately.
- C) It is necessary to wait a short time before attempting a reset.

127. T71 FEX

Which type voltage regulator uses a variable resistance element for controlling dc generator field current?

- A) Vibrator.
- B) Solid-state.
- C) Carbon-pile.

128. T75 FEX

What is a feature of a nontrip-free circuit breaker?

- A) It is impossible to manually hold it in the closed position.
- B) Emergency circuits may be powered by holding it in a closed position.
- C) More amperage than its rated capacity and heavy overloads can be carried for a short time.

129. T72 FEX

What is a purpose of a rotary inverter?

- A) Change 115 volts ac to 28 volts dc.
- B) Convert dc to 115 volts, 400-Hz power.
- C) Transform 26/29 volts dc to 115/200 volts dc.

130. T75 FEX

How many spare electrical fuses are required for use in flight?

- A) One complete spare set.
- B) Three fuses of each size that is installed.
- C) 50 percent for each rating required but not less than one for a particular rating.

131. S66 FEX

What is residual voltage?

- A) Voltage produced that is not in phase with the current.
- B) Voltage stored in the generator exciter output windings.
- C) Voltage produced by permanent magnets which starts the ac generator output.

132. T66 FEX

What will neutralize the electrolyte from a lead-acid battery?

- A) Soap and water.
- B) Bicarbonate of soda.

C) Boric acid, a solution of acetic acid, lemon juice, or vinegar.

133. T69 FEX

Why is it important that all electrical loads and power sources be turned off before connecting or disconnecting the battery?

- A) To prevent discharging the battery.
- B) To prevent a spark from igniting explosive gas.
- C) To prevent power surges from spiking sensitive equipment.

134. S66 FEX

What is the difference between a relay and a solenoid?

- A) Relays have movable cores.
- B) Solenoids have movable cores.
- C) Relays are used as mechanical control devices.

135. S31 FEX

If the cabin rate of climb is too great, how should the pressurization controls be adjusted?

- A) Open the outflow valve slower.
- B) Close the outflow valve faster.
- C) Increase the amount of incoming air.

136. S31 FEX

In a pressurized system, what is the purpose of the dump valve?

- A) Relieve a negative pressure differential.
- B) Relieve all positive pressure from the cabin.
- C) Relieve any pressure in excess of maximum cabin differential.

137. S31 FEX

What component of a pressurization system prevents the cabin altitude from becoming higher than the airplane altitude?

- A) Cabin rate of descent control.
- B) Negative pressure relief valve.
- C) Compression ratio limit switch.

138. T30 FEX

Which best describes cabin differential pressure?

- A) The difference between ambient and internal air pressure.
- B) The difference between the cabin flight altitude pressure and MSL pressure.

C) The difference between the cabin pressure controller setting and the actual cabin pressure.

139. S31 FEX

Which control systems for operating cabin pressurization use reference chamber air pressure within the controller to regulate the outflow valve?

- A) Isobaric and differential.
- B) Unpressurized and pressurized controls.
- C) Ambient, differential, and maximum differential.

140. S69 FEX

What oxygen flow condition should exist if the oxygen regulator selector is placed in the emergency position and the supply lever is on?

- A) 100 percent oxygen available on demand.
- B) Continuous flow of diluted oxygen under positive pressure.
- C) Continuous flow of 100 percent oxygen under positive pressure.

141. T49 FEX

What is one danger of any oxygen leak?

- A) Oxygen being highly flammable may cause combustible materials to burn intensely.
- B) Combustible materials will ignite more rapidly and burn with greater intensity in oxygen rich conditions.
- C) Any ignition source may ignite highly explosive oxygen which over a period of time saturates the surroundings in poorly vented areas.

142. T49 FEX

Why must oxygen not be permitted to come in contact with oil, grease, or solvents?

- A) Oxygen is highly flammable and will cause petroleum products to burn or explode.
- B) Oxygen contact with petroleum products can cause spontaneous fires or explosions.
- C) Gaseous oxygen is chemically unstable and will combine with petroleum to form a highly explosive mixture.

143. S69 FEX

Which position should be selected on the diluter-demand oxygen regulator if there is smoke in the cockpit?

- A) Normal.
- B) Emergency.
- C) 100 percent.

144. T34 FEX

What direction should the ailerons move when the control wheel is moved?

- A) Left aileron up when the control wheel is moved right.
- B) Right aileron down when the control wheel is moved left.
- C) Right aileron down when the control wheel is moved right.

145. T12 FEX

Alcohol is added to the fluid in a water injection system to

- A) increase the octane.
- B) provide increased cooling.
- C) prevent freezing of the water.

146. T12 FEX

Water-soluble oil is added to the water-alcohol mixture used for water injection to

- A) prevent corrosion.
- B) provide lubrication.
- C) increase the viscosity of the antidetonation fluid.

147. T12 FEX

The purpose of water injection is to

- A) suppress detonation.
- B) increase fuel economy.
- C) prevent carburetor ice.

148. T48 FEX

Which publication determines when an airplane may be flown with a fuel leak?

- A) FAR Part 25.
- B) The applicable manufacturer's manual.
- C) AC 65-9A, Airframe and Powerplant Mechanics General Handbook.

149. T48 FEX

A reason for using a crossfeed fuel system is to

- A) be able to purge any fuel tank.
- B) jettison fuel during emergencies.
- C) help maintain aircraft stability.

150. S04 FEX

One purpose of a fuel tank boost pump is to prevent vapor lock caused by low

- A) temperature.

- B) altitude operation.
- C) atmospheric pressure.

151. T10 FEX

The purpose of the hopper tank is to

- A) permit a fast warmup of the engine oil.
- B) collect sludge and particles from the oil in the event the oil filter becomes obstructed.
- C) provide engine oil to feather the propeller in the event an oil line should break and all of the engine oil is pumped overboard.

152. T46 FEX

What action should be taken if a hydraulic stationary connection has a static leak?

- A) Reduce the accumulator pressure.
- B) Notify maintenance to repair it.
- C) Pressurize the system and perform an operational check.

153. S63 FEX

What is a limitation of MIL-H-5606?

- A) Flammable.
- B) Chemically unstable.
- C) High viscosity change with temperature.

154. T46 FEX

The purpose of a hydraulic accumulator is to

- A) store hydraulic fluid under pressure.
- B) collect hydraulic fluid from system leaks.
- C) gather foam and extract the air before returning it to the reservoir.

155. S63 FEX

Pressure from an engine-driven hydraulic pump may be regulated by a

- A) system bypass valve.
- B) constant speed drive.
- C) in-line variable restrictor orifice.

156. S63 FEX

What is the difference between a hydraulic sequence valve and a priority valve?

- A) Sequence valves are electrically actuated.
- B) Mechanical contact opens a priority valve.

C) Priority valves are opened by hydraulic pressure.

157. T46 FEX

What will the hydraulic pressure gauge indicate when the accumulator charge is lost and the monitor is on the air side of a diaphragm-type accumulator?

- A) Zero.
- B) System pressure.
- C) Between one-third and one-half of the system's operating pressure.

158. T46 FEX

What type of gas may be used to service hydraulic accumulators?

- A) Nitrogen.
- B) Dry oxygen.
- C) Carbon dioxide.

159. T46 FEX

Which principle operates a hydraulic fuse?

- A) Heat.
- B) Electrical.
- C) Differential pressure.

160. S63 FEX

The purpose of pressurizing a hydraulic reservoir is to

- A) provide an alternate source of pressure in case of a hydraulic pump failure.
- B) assure a positive feed of foam free fluid to the hydraulic pump at high altitudes.
- C) insure an adequate supply of fluid to the hydraulic pump inlet during negative-G flight.

161. T46 FEX

Why should hydraulic fluid be filtered?

- A) Water in the fluid could freeze.
- B) It assures a positive feed of foam free fluid to the hydraulic pump inlet.
- C) Contaminants may damage the seals and cylinder walls causing internal leakage.

162. T46 FEX

What is the significance of the pop-out indicator on some hydraulic filters?

- A) Confirmation of fluid thermal expansion in the gear, flaps, or other systems.
- B) Evidence that contaminants may prevent components such as check valves from operating.
- C) Indication of overfilling and the fluid level of the hydraulic reservoir should be checked.

163. T46 FEX

One purpose of a hydraulic accumulator is to

- A) compress hydraulic fluid.
- B) absorb sudden pressure surges.
- C) store hydraulic fluid from small system leaks.

164. S64 FEX

The purpose of fusible plugs in the wheel is to prevent

- A) tire blowout.
- B) overservicing the tire.
- C) damage to the tire resulting from heat expansion.

165. T47 FEX

The purpose of fusible plugs in aircraft wheels is to

- A) prevent tire blowouts.
- B) quickly deflate tires for repair.
- C) protect the antiskid electrical system.

166. S26 FEX

One of the main gear tires has deflated as a result of a thermal fuse melt. What does this mean?

- A) Heavy braking has overheated the wheel, melted a plastic fuse in the rim, and prevented the danger of a tire blowout.
- B) High tire temperatures have melted a fusible metal plug installed in the aircraft wheel and caused the tire to deflate.
- C) High temperatures in the wheel well have caused the tire's temperature sensitive valve core to melt, deflated the tire, and prevented damage to the wing.

167. T46 FEX

What type of gas is normally used to service the air-storage bottles of an emergency pneumatic system?

- A) Nitrogen.
- B) Dry oxygen.
- C) Carbon dioxide.

168. T46 FEX

Moisture in a pneumatic system may cause

- A) corrosion.
- B) a variety of sounds including banging, squealing and chattering.

C) return lines to freeze when the pressure of the air drops during actuation.

169. S48 FEX

Afterfiring is caused by

- A) the spontaneous combustion of the unburned charge ahead of the flame fronts after the ignition of the charge.
- B) charges of unburned fuel in the exhaust gas mixing with air outside the exhaust and igniting, causing an explosion in the exhaust system.
- C) a mixture so lean that combustion not completed on the exhaust stroke ignites the contents of the intake manifold when the intake valve opens.

170. S48 FEX

What is detonation?

- A) The unburned fuel/air mixture ahead of the flame fronts explodes spontaneously after the ignition of the charge.
- B) The charges of unburned fuel in the exhaust gas mix with air outside the exhaust and ignite causing an explosion in the exhaust system.
- C) The mixture is so lean that combustion is not complete at the exhaust stroke and the contents of the intake manifold ignite when the intake valve opens.

171. S48 FEX

Backfiring is caused by

- A) fouled spark plugs, defective fuel injection nozzles, or incorrect valve clearances.
- B) charges of unburned fuel in the exhaust gas mixing with air outside the exhaust and igniting, causing an explosion in the exhaust system.
- C) a mixture so lean that combustion not completed on the exhaust stroke ignites the contents of the intake manifold when the intake valve opens.

172. S48 FEX

Preignition is indicated by

- A) intermittent firing and low cylinder temperatures.
- B) explosions from the exhaust system with torching or afterburning.
- C) engine roughness and a sudden increase in cylinder head temperatures.

173. T29 FEX

If the line between the manifold pressure gauge and the engine induction system is broken, the gauge will indicate

- A) ambient pressure.
- B) standard atmospheric pressure.
- C) high when operating at a manifold pressure above atmospheric pressure.

174. T29 FEX

If the line between the MAP gauge and the engine induction system has a leak, the gauge will indicate

- A) ambient pressure.
- B) 29.92 inches of MAP.
- C) low when operating at a MAP above atmospheric pressure.

175. S20 FEX

Which of the following situations will most likely cause the engine to backfire through the induction system when operated at low RPM?

- A) A clogged air inlet.
- B) The idle speed set too low.
- C) An excessively lean mixture setting.

176. T10 FEX

Excessive oil in the lower cylinder heads is an indication of

- A) worn oil control rings.
- B) oil supply line bypass valve failure.
- C) intercylinder drains that are partially or completely blocked.

177. S45 FEX

How are the cylinders numbered in a double-row radial engine?

- A) Clockwise as viewed from the engine front.
- B) Clockwise as viewed from the accessory end.
- C) Counterclockwise as viewed from the accessory end.

178. T11 FEX

The primary purpose of exhaust augmenters is to

- A) increase engine cooling.
- B) provide additional thrust.
- C) decrease exhaust back pressure.

179. S20 FEX

While performing the ground check the supercharger control is shifted from the high to the low position. Normal operation of the supercharger will be indicated by

- A) a sudden decrease in manifold pressure.
- B) the manifold pressure remaining the same.
- C) a momentary increase in manifold pressure.

180. S49 FEX

What should be the position of the supercharger control when executing a go-around if the engine is equipped with a single-stage, two-speed supercharger?

- A) Off.
- B) Low blower.
- C) High blower.

181. T12 FEX

What effect does an increase in atmospheric humidity have on brake horsepower output of a water/ alcohol injected engine?

- A) A power loss will be experienced by either a wet or dry takeoff.
- B) A wet engine takeoff will lose power more rapidly than a dry engine takeoff.
- C) A pressure-injected carburetor will not be affected by increased humidity.

182. T12 FEX

What will result if too much antidetonation fluid is injected during takeoff?

- A) Power loss.
- B) Temporary power increase.
- C) Engine overheat and detonation.

183. T12 FEX

How does increased humidity affect engine performance on takeoff?

- A) Engine temperatures will increase.
- B) The fuel/air ratio will decrease below best power.
- C) Water vapor will displace oxygen which increases the mixture richness.

184. T12 FEX

How does high humidity affect engine performance on takeoff without water injection?

- A) Power will increase slightly.
- B) Power will decrease substantially.
- C) Power will not change significantly.

185. T12 FEX

Alcohol is added to the fluid in a water injection system to

- A) increase the octane.
- B) provide greater cooling.
- C) prevent freezing of the water.

186. T12 FEX

A minimum loss of power will occur on takeoff in high humidity conditions if

- A) the carburetor is set at full rich.
- B) the mixture is set for emergency rich and additional fuel is injected.
- C) the fuel/air ratio is set for best power and the takeoff is wet (with antidetonation fluid).

187. S48 FEX

The first step to correct preignition is to

- A) retard the throttle.
- B) increase the mixture.
- C) decrease the mixture.

188. S48 FEX

If an attempt is made to start an engine with a hydraulic lock,

- A) a connecting rod can bend or break if the crankshaft continues to rotate.
- B) the starter gearbox can overtorque since the liquid is incompressible and stops piston movement.
- C) the fuel or oil from the lower cylinders can be injected into the exhaust system causing afterfiring.

189. S48 FEX

Which procedure should be followed prior to starting an engine with a hydraulic lock?

- A) Remove the lower sparkplugs and rotate the engine in the normal direction of rotation.
- B) Remove the front or back sparkplugs from the top cylinders and pull the propeller through a minimum of two complete turns.
- C) Remove the lower sparkplugs and pull the engine through backwards to prevent fuel or oil from being injected into the intake pipe and causing a lock on the next start.

190. T09 FEX

What may cause engine detonation?

- A) High octane fuel.
- B) Low manifold pressure.
- C) High intake air temperatures.

191. S14 FEX

What does an increase of approximately 125 propeller RPM indicate during shutdown?

- A) Idle mixture is correct.
- B) Idle mixture is too lean.
- C) Idle mixture is too rich.

192. S54 FEX

Which is a feature of the propeller feathering system?

- A) Throttle levers may be in any position for the autofeather system to operate.
- B) Retarding a throttle to idle on takeoff will cause the autofeather system to operate.
- C) Propeller blades are held in the full feather position by aerodynamic forces.

193. S54 FEX

What initial action is taken to unfeather a Hamilton-Standard Hydromatic propeller?

- A) Place the aircraft in a shallow dive to start the propeller windmilling.
- B) Turn the autofeather system off and place the propeller lever to the full forward position.
- C) Hold the feather button in until the propeller starts windmilling, then release for restart.

194. S54 FEX

Retarding the throttle setting in cruise flight will result in

- A) a decrease in blade angle.
- B) an increase in blade angle.
- C) a decrease in propeller RPM.

195. S54 FEX

Which operational force creates the greatest stress on a propeller?

- A) Centrifugal.
- B) Torque bending.
- C) Aerodynamic twisting.

196. S18 FEX

In the propeller deicing system, electrical power is transferred to the propeller hub assembly

- A) through slip rings and carbon brushes.
- B) through flexible electrical connectors.
- C) by use of slip rings and segment plates.

197. S18 FEX

The force which tries to feather the propeller blade is

- A) torque bending.
- B) aerodynamic twisting.
- C) centrifugal twisting moment.

198. S18 FEX

Which flight conditions will result in the largest propeller blade angle?

- A) Initial climb-out.
- B) Approach to landing.
- C) High-speed, high-altitude cruise flight.

199. S18 FEX

Which best describes the blade movement of a feathering propeller set in the HIGH RPM position when the feathering action is begun?

- A) Low pitch through reverse, to feather.
- B) High pitch through low pitch, to feather.
- C) Low pitch through high pitch, to feather.

200. T55 FEX

What is the minimum glycol content of Type 1 deicing/anti-icing fluid?

- A) 30 percent.
- B) 50 percent.
- C) 80 percent.

201. T55 FEX

Which of the following procedures will increase the holding time during the anti-ice phase of a two-step process?

- A) Glycol content is raised to 100 percent.
- B) The Type 2 fluid is heated before application.
- C) The Type 2 fluid is applied with centrifugal pumps.

202. M51 FEX

The purpose of diluting ethylene glycol deicing fluid with water in nonprecipitation conditions is to

- A) raise the eutectic point.
- B) decrease the freeze point.
- C) increase the minimum freeze point (onset of crystallization).

203. T55 FEX

What should the temperature be for deicing fluid dispensed by a ground unit?

- A) Cold.
- B) Heated.
- C) Ambient.

204. T55 FEX

Which procedure increases holding time when deicing/anti-icing an airplane using a two- step process?

- A) Heated Type 1 fluid followed by cold Type 2 fluid.
- B) Cold Type 2 fluid followed by hot Type 2 fluid.
- C) Heated Type 1 or 2 fluid followed by cold Type 1 fluid.

205. M51 FEX

Anti-icing fluid should provide freezing point protection to

- A) -20 °F ambient temperature.
- B) +32 °F outside temperature or below.
- C) a freezing point no greater than 20 °F below the ambient or airplane surface temperature.

206. T39 FEX

What indicates corrosion below an aluminum clad surface attacking the metal interior?

- A) White blotches.
- B) Greenish deposits.
- C) Small, dark grey lumps.

207. S38 FEX

Self-locking nuts should be inspected on preflight for

- A) a minimum of three full threads engaged by the nut.
- B) at least one full thread protruding beyond the nut.
- C) at least two full threads protruding beyond the nut.

208. J11 FEX

When are ATIS broadcasts updated?

- A) Only when the ceiling or visibility changes by a reportable value.
- B) Every 30 minutes if weather conditions are below basic VFR, otherwise hourly.
- C) Upon receipt of any official weather, regardless of content change or reported values.

209. J11 FEX

What effect does the barometric settings on the pilot and copilot altimeters have on the MODE C altitude information transmitted by the transponder?

- A) Neither pilot altimeter setting has an effect.
- B) The pilot's indicated altitude will be reflected on the ATC radar display.
- C) The copilot's indicated altitude will be transmitted if equipped with two transponders and the second transponder is selected.

210. T55 FEX

Which of the following will decrease the holding time during anti-icing using a two-step process?

- A) Apply heated Type 2 fluid.
- B) Decrease the water content.
- C) Increase the viscosity of Type 1 fluid.

211. J31 FEX

To which position should the oxygen regulator be set when symptoms of hypoxia or hyperventilation are experienced?

- A) Normal.
- B) Emergency.
- C) 100 percent oxygen.

212. A01 FEX

What is the CFR Part 1 definition of critical engine?

- A) The outboard engine whose failure would most adversely affect safety.
- B) The engine still running which would most adversely affect performance if it should fail.
- C) The engine whose failure would most adversely affect airplane performance or handling qualities.

213. T30 FEX

The angle between the chord line of the wing and the longitudinal axis of the airplane is known as the angle of

- A) attack.
- B) dihedral.
- C) incidence.

214. D15 FEX

A flight engineer operating under CFR part 121 must receive recurrent training on

- A) normal operation of the airplane flight systems within the preceding 6 calendar months.
- B) emergency operation of all airplane flight systems within the preceding 12 calendar months.
- C) alternate operation of the airplane flight systems within the preceding 24 calendar months.

215. D20 FEX

Which flight crewmembers may leave their station during cruising flight to perform normal duties?

- A) One pilot and the flight engineer together when required.
- B) Either pilot or the flight engineer, but only one at a time.
- C) One pilot or the flight engineer if the flight engineer station is occupied by a pilot.

216. D20 FEX

Which flight crewmember nonessential conversation is allowed below 10,000 feet?

- A) Discussing stock market reports during taxi.
- B) Ordering something to drink from the galley while cruising at 8,000 feet.
- C) Confirming airplane logbook entries during climb when clear of the airport traffic area.

217. D20 FEX

When is a flight engineer required to remain at the flight engineer panel with his or her seatbelt fastened?

- A) During taxi, takeoff, and landing.
- B) During takeoff, climbs, descents, and landing.
- C) Whenever the airplane is in motion, except when the absence is necessary for the performance of his or her duties in connection with the operation of the airplane.

218. D21 FEX

The function of the minimum equipment list is to indicate required items which

- A) may be inoperative for a flight beyond a terminal point.
- B) cannot be missing from the airplane for any air carrier flight.
- C) are required to be operative when the airplane is used on domestic passenger scheduled flights.

219. D22 FEX

Which documents are required to be carried aboard each domestic air carrier flight conducted under CFR part 121?

- A) Load manifest and flight release.
- B) Dispatch release, load manifest, and flight plan.
- C) Maintenance release, weight and balance release, and flight plan.

220. D20 FEX

Who is responsible for noting mechanical irregularities in the aircraft maintenance log?

- A) Flight engineer.
- B) Pilot in command.
- C) Certificate holder or designated representative.

221. D17 FEX

Duty and rest period rules for domestic air carrier operations require that a flight crewmember

- A) not be assigned to any duty with the air carrier during a required rest period.
- B) be relieved of all duty for at least 48 hours during any 7 consecutive days.
- C) not be assigned to any duty for a period of at least 18 hours if the flight crewmember had been on duty aloft for 9 hours.

222. D15 FEX

What are the minimum flight engineer operating experience requirements for reciprocating-powered airplanes when common carriage is involved?

- A) Flight engineer duties performed for 8 hours under the supervision of a check airman in flight.
- B) Flight engineer duties performed for 10 hours under the supervision of a qualified flight engineer.
- C) Flight engineer duties performed for 12 hours under the supervision of a qualified pilot in command.

223. D15 FEX

Which requirement must be met by all flight engineers every 6 months before they can serve on an air carrier flight under CFR part 121?

- A) Line check or route check.
- B) Recurrent flight and ground training.
- C) 50 hours of flight time or a flight check.

224. D11 FEX

Which requirement applies to emergency equipment (fire extinguishers, megaphones, first aid kits, and crash ax) installed in an air carrier airplane?

- A) The equipment must be clearly marked to indicate its method of operation.
- B) The equipment must be accessible to the crew and passengers regardless of location.
- C) The equipment located in the passenger compartment must be stored in a compartment or container.

225. D11 FEX

Interior emergency exit lights should be checked for operation. CFR's require that these lights must

- A) be operable from the flight deck only.
- B) be armed or turned on during ground operation and all flight operations.
- C) be operable manually from the flightcrew station and the passenger compartment.

226. B15 FEX

How long shall cockpit voice recorder and flight recorder data be kept in the event of an accident or occurrence resulting in termination of the flight?

- A) 60 days.
- B) 90 days.
- C) 120 days.

227. D11 FEX

Above which cabin altitude must oxygen be provided for all persons during the entire flight?

- A) All crewmembers 10,000 feet; all passengers 12,000 feet.
- B) All crewmembers 12,000 feet; all passengers 15,000 feet.

C) All crewmembers 10,000 feet; all passengers 15,000 feet.

228. D13 FEX

If the flight engineer becomes incapacitated, who may perform flight engineer duties during an IFR flight conducted under CFR part 121?

- A) Any crewmember designated by the pilot-in-command.
- B) A pilot crewmember, but only if flight engineer certificated.
- C) Either pilot, but only if qualified to perform flight engineer functions.

229. D11 FEX

How much supplemental oxygen must pressurized air carrier transport airplanes carry for each flight crewmember on flight deck duty when operating at flight altitudes above 10,000 feet?

- A) A minimum of 1 hours' supply.
- B) A minimum of 2 hours' supply.
- C) A minimum of 30 minutes' supply.

230. D30 FEX

Which CFR governs airplane operations when common carriage is not involved?

- A) CFR part 135 for cargo flights.
- B) CFR part 121 for test flights.
- C) CFR part 125 for passenger flights.

231. D36 FEX

Which maintenance task may a flight engineer perform while operating under CFR part 125?

- A) Landing light replacement if there is no certificated mechanic available.
- B) Remove, inspect, and replace a chip detector if the malfunction occurs in a remote area.
- C) Prefabricated fuel line replacement if an appropriate mechanic certificate is held, an approved training program completed and authorized in writing by the certificate holder.

232. D36 FEX

Who may replace a seatbelt on an airplane operated under CFR part 91 by a Letter of Deviation Authority from CFR part 125?

- A) Any person designated in writing by the maintenance organization arranged by the certificate holder to perform maintenance.
- B) The flight engineer as long as it does not involve complex assembly operations and that task is listed in the FAA-approved Certificate Holder's Manual.
- C) The pilot-in-command regardless of whether the Letter of Deviation Authority provides relief from the specific requirements of CFR part 125, Subpart G.

233. A30 FEX

Which is the latest date that a flight engineer may perform duties if his or her last medical examination was a first-class conducted on August 25, 1999?

- A) September 30, 2000
- B) August 25, 2000
- C) August 31, 2000

234. A30 FEX

Refusal by a flight engineer to furnish drug or alcohol test results when requested by an FAA inspector is grounds for

- A) revocation of their flight engineer and pilot certificates.
- B) suspension of their medical certificate for a period of up to 1 year.
- C) denial of an application for any certificate or rating for a period of up to 5 years.

235. A30 FEX

A person with a physical deficiency under the standards of CFR part 67 for their medical certificate

- A) may not perform flight engineer duties.
- B) must surrender the medical certificate to an FAA inspector.
- C) must have a recheck by an FAA medical examiner before returning to flight crewmember duties.

236. D30 FEX

An airplane may be operated under CFR part 91 while carrying passengers or cargo when

- A) the operator has a Letter of Deviation Authority issued under CFR part 125.
- B) the flight is for training, ferrying, positioning, or maintenance purposes.
- C) there are less than 20 seats installed in the airplane or the cargo weighs less than 6,000 pounds.

237. B07 FEX

No person may act as a crewmember while under the influence of alcohol or when he or she has consumed alcoholic beverages within the preceding

- A) 8 hours.
- B) 12 hours.
- C) 24 hours.

238. J26 FEX

The accuracy of an altimeter is questionable when the difference between the

- A) pilot and copilot altimeters is more than 75 feet in flight.
- B) known field elevation and the indicated altitude is more than 75 feet.
- C) indicated altitude and the altitude reported by ATC is more than 100 feet.

239. H126 FEX

Zero fuel weight is defined as the

- A) basic operating weight plus payload.
- B) empty weight plus passengers and cargo.
- C) takeoff weight minus fuel to destination and alternate.

240. H122 FEX

(Refer to figure 40.) What is the loaded CG in percent of MAC under operating conditions No. 1?

- A) 28.9 percent.
- B) 30.5 percent.
- C) 32.9 percent.

241. H126 FEX

(Refer to figure 52.) What is the maximum payload under operating conditions No. 1?

- A) 20,500 pounds.
- B) 21,500 pounds.
- C) 25,500 pounds.

242. H124 FEX

(Refer to figure 53.) What minimum weight of cargo must be shifted from the forward to the aft cargo location to bring the CG within limits under operating conditions No. 1?

- A) 195 pounds.
- B) 410 pounds.
- C) 455 pounds.

243. H124 FEX

If the landing gear on an airplane moves forward during retraction, the

- A) total moments will decrease.
- B) total moments will increase.
- C) total moments will remain the same.

244. H124 FEX

If the landing gear of an airplane moves rearward upon gear retraction, the CG will

- A) move aft.
- B) move forward.
- C) remain the same.

245. W16 FEX

The purpose of airplane wing dihedral angle is to

- A) increase lateral stability.
- B) increase longitudinal stability.
- C) increase lift coefficient of the wing.

246. S69 FEX

To which elevation should the cabin altitude be set for the following landing conditions?

Altimeter	30.12
Field elev	6172 ft
Airplane cabin depressurized	500 ft AGL
Cabin pressure controller calibrated to	29.92

- A) 6,472 feet.
- B) 6,672 feet.
- C) 6,792 feet.

247. S69 FEX

(Refer to figure 6.) An airplane is limited to a cabin pressure differential of 10 inches Hg with a cracked window inner laminate. Which is the maximum altitude that the airplane can be flown and maintain a cabin altitude of sea level?

- A) 9,000 feet.
- B) 10,000 feet.
- C) 11,000 feet.

248. S69 FEX

(Refer to figure 6.) Which is the lowest cabin altitude that can be maintained at FL 320 with a pressure differential of 14.2 inches Hg?

- A) -1,000 feet.
- B) +1,000 feet.
- C) +8,000 feet.

249. T31 FEX

(Refer to figure 27.) What is the total fuel burn for a 1,500 NM cruising flight under operating conditions No. 4?

- A) 19,060 pounds.
- B) 19,200 pounds.
- C) 22,500 pounds.

250. S24 FEX

In an electrically heated windshield system, what maintains normal windshield temperature?

- A) Thermistors.
- B) Electronic amplifiers.
- C) Thermal overheat switches.

251. T66 FEX

Why is it necessary to periodically completely discharge and recharge a nickel-cadmium battery?

- A) To restore electrolyte levels.
- B) To eliminate cell imbalance and loss of capacity.
- C) To dissolve nickel oxide formations on positive cells to restore capacity.

252. T66 FEX

What causes cell imbalance in a nickel-cadmium battery?

- A) Low temperatures.
- B) Deep rapid discharges.
- C) Constant-potential (voltage) charging.

253. T66 FEX

What condition characterizes a thermal runaway?

- A) Increased resistance of the battery to input current.
- B) High temperature and undercharging at a constant rate.
- C) Continuous rising current and increasing battery temperature.

254. S66 FEX

What speed does a frequency meter give a direct indication of?

- A) Engine N_2 .
- B) Generator RPM.
- C) CSD input speed.

255. T72 FEX

Which are control functions of an ac generator control unit?

- A) Manual paralleling.
- B) Nonessential-power relay control.
- C) Generator field control and indication.

256. T66 FEX

What is a function of the cellophane portion of the separator in a nickel-cadmium battery?

- A) Separates positive and negative cells.
- B) Seals the cell to prevent leakage of electrolyte.

C) Inhibits oxygen formed, when overcharging, from recombining with cadmium and creating heat that may lead to a thermal runaway.

257. T66 FEX

What is a function of the separator cellophane in a nickel-cadmium battery?

- A) Inhibits thermal runaway.
- B) Separates negative and positive cells.
- C) Prevents electrolyte leakage and contamination.

258. S31 FEX

The cabin pressure control setting has a direct effect upon the

- A) compressor speed.
- B) outflow valve opening.
- C) pneumatic system pressure.

259. T49 FEX

What is an advantage of a chemical over a gaseous oxygen system?

- A) Fire hazards are reduced by eliminating oxygen lines.
- B) Chemical systems may be shutoff at any time after they are activated.
- C) Reliability is improved by interconnecting individual chemical units.

260. S27 FEX

How does the thermocouple in a fire detection system cause the warning system to operate?

- A) Heat increases electrical resistance.
- B) Heat generates a small electrical current.
- C) Heat causes expansion and a ground to form.

261. S55 FEX

The purpose of an elevator trim tab is to

- A) provide horizontal balance as airspeed is increased to allow hands-off flight.
- B) adjust the upward tail load for different airspeeds in flight allowing neutral control forces.
- C) modify the downward tail load for various airspeeds in flight eliminating flight control pressures.

262. S04 FEX

Mixing aviation gasoline with jet fuel will effect a turbine powerplant by forming deposits on the

- A) turbine blades.
- B) compressor blades.
- C) inlet guide vanes.

263. S04 FEX

When comparing jet fuel to aviation gasoline, which statement is correct?

- A) Both jet fuel and gasoline are equally susceptible to contamination.
- B) Jet fuel is of a higher viscosity, and holds contaminants better.
- C) Jet fuel is of higher viscosity, and will not hold contaminants as well as gasoline.

264. S42 FEX

What is the difference between Jet A and Jet A-1 fuel?

- A) Jet A is colorless and Jet A-1 is straw colored.
- B) Jet A has a freeze point of -40 °C and Jet A-1 has a freeze point of -47 °C.
- C) Jet A-1 is a blend of gasoline and kerosene made for operating at extremely low temperatures.

265. S42 FEX

What is the difference between Jet A and Jet B fuel?

- A) Jet A is colorless and Jet B is straw colored.
- B) Jet A has a freeze point of -40 °C and Jet B has a freeze point of -47 °C.
- C) Jet B is a blend of gasoline and kerosene made for operating at extremely low temperatures.

266. T18 FEX

With regard to the fuel/air mixture in the space above the fuel in the tanks, which should be a consideration in refueling?

- A) Gasoline-type fuels (Jet B) produce a rich mixture which is easily ignited at normal temperatures.
- B) Mixing Jet A and JP/4 produces a fuel/vapor mixture that is ignitable through a wide temperature range.
- C) Vapor pressure of Jet A type fuel is too high to develop an ignitable mixture at normal temperatures.

267. S68 FEX

Entrained water in aviation turbine fuel is a hazard because of its susceptibility to freezing as it passes through the filters. Which is a common method of preventing this hazard?

- A) Use of micromesh fuel strainers.
- B) Use of anti-icing fuel additives.
- C) Adding deicing fluid to the fuel.

268. S52 FEX

If the oil cooler relief valve should stick in the open position, what would be the probable result?

- A) Decreased oil temperature.
- B) Increased oil temperature.

C) Pressurization of the case and oil leakage.

269. T46 FEX

An advantage of a piston-type accumulator is that it

- A) takes up less area than a sphere-type accumulator.
- B) may be used with higher pressure than a bladder-type accumulator.
- C) can store more hydraulic fluid than a diaphragm-type accumulator.

270. S63 FEX

Why should synthetic hydraulic fluid be stored in an airtight container?

- A) High evaporation rate.
- B) Vapor is extremely toxic.
- C) Atmospheric moisture contamination.

271. S63 FEX

How may pressure from an engine-driven hydraulic pump be regulated?

- A) Constant speed drive.
- B) Variable-displacement pump.
- C) In-line variable restrictor orifice.

272. S64 FEX

What item of the antiskid system enables full braking action during taxi and parking?

- A) The locked-wheel arming circuit is inoperative at taxi speeds.
- B) The antiskid switch is manually disarmed on the afterlanding checklist.
- C) The wheel-speed sensors automatically disarm the antiskid system at speeds below about 20 miles per hour.

273. S64 FEX

The purpose of the antiskid system control box is to

- A) sense wheel speed change.
- B) prevent landing with the brakes applied.
- C) meter the brake pressure to prevent stoppage of wheel rotation.

274. S26 FEX

Which of the following conditions will cause the landing gear warning signal to sound?

- A) Power lever retarded below cruise and landing gear not in transit.
- B) One power lever retarded to idle and the landing gear not locked down.
- C) Landing gear locked down, flaps up, and power levers advanced above cruise.

275. S46 FEX

Which location has the highest gas volume in a turbine engine?

- A) Turbine outlet.
- B) Compressor outlet.
- C) Combustion chamber outlet.

276. S46 FEX

Which location has the highest gas pressure in a turbine engine?

- A) Turbine outlet.
- B) Compressor outlet.
- C) Combustion chamber outlet.

277. T24 FEX

It is important to note the maximum TIT when starting a turbine engine to

- A) determine whether the engine must be inspected or removed and overhauled.
- B) prevent operation in excess of limits which may cause compressor burn-through or metal distortion.
- C) prevent dangerous temperatures and gas velocities which may cause injury to personnel and ground service equipment.

278. S81 FEX

Which engine instrument is most likely to show an elevated reading if the turbine wheel has damage?

- A) TIT.
- B) Engine RPM.
- C) Torquemeter.

279. S81 FEX

Which engine instrument will indicate a higher-than-normal reading if the compressor has damage?

- A) Engine RPM.
- B) Torquemeter.
- C) Turbine inlet temperature.

280. S46 FEX

How does compressor RPM affect the power output of a turboprop engine?

- A) Power increases linearly with an increase in compressor speed.
- B) Efficiency increases when compressor blade tips reach Mach 1 or slightly higher.
- C) Compressor aerodynamics cause a nonlinear increase in power relative to compressor speed.

281. T02 FEX

Equivalent shaft horsepower (ESHP) is defined as

- A) the total power delivered to the propeller.
- B) the shaft horsepower plus the effects of the jet thrust produced by the engine.
- C) the actual amount of horsepower delivered to the propeller shaft that is equivalent to 33,000 foot-pounds of work per minute.

282. S48 FEX

While starting a turbine engine with an air starter, a hung start occurs before the starter disengages. Which procedure is correct?

- A) Shut down the engine.
- B) Increase the air velocity to the starter.
- C) Slowly increase the power lever until the engine accelerates to idle.

283. T24 FEX

Which is the most critical parameter for a turbine engine during starting?

- A) TIT.
- B) Oil pressure.
- C) Starter engagement time.

284. S48 FEX

Heat and centrifugal force on turbine blades causes

- A) galling.
- B) creeping.
- C) stretching.

285. S48 FEX

Exceeding the engine temperature limitations may result in

- A) discoloration of the compressor blades.
- B) rippling of the trailing edge of the compressor blades.
- C) hairline cracks at right angles to the turbine blade leading and trailing edges.

286. S48 FEX

Which action should be completed immediately during the start sequence if the ITT attempts to exceed the temperature limit? Shut off the

- A) fuel.
- B) starter.
- C) ignition.

287. T25 FEX

The propeller synchronization has a limited RPM range to prevent the possibility of

- A) a runaway master engine from overspeeding all the engines.
- B) overtorquing the other engines in case the master engine fails and is feathered.
- C) the other engines losing more than a limited amount of RPM in case the master engine fails.

288. T26 FEX

Beta range refers to the

- A) propeller RPM range controlled by the prop levers.
- B) propeller blade angle which can produce zero or negative thrust.
- C) second letter of the Greek alphabet used to represent a constant propeller RPM within the flight range of the throttle.

289. M08 FEX

What safeguard should be taken when using mobile ground deice/anti-ice equipment?

- A) Open the air-conditioning pack valves.
- B) Operate the airplane engines above idle to prevent flameout.
- C) Apply fluid to the lower door sills and the door bottoms prior to closing for flight.

290. J26 FEX

When should the altimeters be set to 29.92 during climb?

- A) FL 180.
- B) 18,000 feet AGL.
- C) 18,000 feet MSL.

291. I20 FEX

During a climb, the tropopause can be identified as the altitude where the

- A) jet stream is encountered.
- B) temperature lapse rate makes an abrupt change.
- C) air density starts to increase as altitude increases.

292. I20 FEX

A characteristic of the stratosphere is

- A) a relatively even base altitude of approximately 35,000 feet.
- B) an overall decrease of temperature with an increase in altitude.
- C) a relatively small change in temperature with an increase in altitude.

293. T66 FEX

What is the nominal voltage rating of a fully charged lead-acid battery containing six cells?

- A) 6 volts.
- B) 12 volts.
- C) 24 volts.

294. T64 FEX

What is the voltage of two lead-acid 12 volt batteries connected in series?

- A) 12 volts.
- B) 18 volts.
- C) 24 volts.

295. T66 FEX

What type of gas is released by a lead-acid battery during charging?

- A) Toxic sulfuric acid.
- B) Flammable carbon dioxide.
- C) Oxygen and explosive hydrogen.

296. T49 FEX

Which cabin air-conditioning system utilizes a refrigerant to carry away cabin heat?

- A) Air-cycle.
- B) Vapor cycle.
- C) Evaporative blower.

297. S69 FEX

Which statement is correct with regard to leaking refrigerant R-12?

- A) Refrigerant R-12 is nontoxic to the skin.
- B) Refrigerant R-12 changes to nitric acid if it comes in contact with water.
- C) Refrigerant R-12 changes to deadly phosgene gas if subjected to an open flame.

298. S31 FEX

What is the purpose of ventilating air in a combustion heater?

- A) Keeps the overhead thermal switch cool.
- B) Transports heat to locations where it is needed.
- C) Provides combustion air for ground blower operation.

299. T12 FEX

What will result if an insufficient amount of ADI fluid is injected during takeoff?

- A) Temporary power increase.
- B) Engine overheat and detonation.
- C) Power will remain the same if the fuel/air ratio is increased.

300. T10 FEX

What is the oil viscosity index? The oil viscosity index

- A) indicates how fluid an oil is at low temperature under laboratory conditions.
- B) is an arbitrary method of stating the rate of change in viscosity of an oil with changes of temperature.
- C) is the weight of any oil compared with the weight of an equal volume of oil from the American Petroleum Institute (API) gravity scale.

301. S52 FEX

For engines equipped with Hamilton-Standard Hydromatic propellers the purpose of feeding the engine oil pressure pump from a standpipe is to

- A) minimize the amount of oil that has to be diluted with fuel in cold weather.
- B) provide oil for feathering the propeller in the event an oil line should break.
- C) separate the circulating oil from the surrounding oil when the engine is started to permit a fast warmup of the engine.

302. T10 FEX

The ashless in ashless dispersant refers to oil

- A) crudes that are ash free.
- B) additives that leave no metallic ash.
- C) that has had all ash removed in the refining process.

303. T12 FEX

The main fuel sump strainers are located

- A) at the carburetor inlet chamber.
- B) at the lowest point in the fuel system.
- C) on the aft side of the firewall in each nacelle.

304. T12 FEX

What will result if too much ADI fluid is injected during takeoff?

- A) Power loss.
- B) Temporary power increase.
- C) Engine overheat and detonation.

305. T10 FEX

The purpose of the oil cooler bypass valve is to

- A) bypass the oil cooler when there is a blockage.
- B) control and limit the lubricating oil pressure.
- C) control the flow of oil to the oil cooler according to the temperature and viscosity of the oil.

306. S12 FEX

The total piston displacement of a reciprocating engine is the

- A) relationship of horsepower output per cubic inch of cylinder volume.
- B) volume displaced by one piston during one revolution of the crankshaft.
- C) volume displaced by the sum total of all pistons during one revolution of the crankshaft.

307. T30 FEX

The BMEP indicator measures the

- A) ratio of the shaft output to the power developed in the cylinders.
- B) output shaft torque and converts it to BMEP.
- C) actual power output to the propeller by converting heat energy to mechanical energy.

308. S51 FEX

Does placing the magneto switches in the OFF position guarantee that the propellers are safe to handle?

- A) No, the only safe way to ensure the engines will not fire accidentally is to disconnect the battery.
- B) No, the magneto switches may fail in the closed position and current will continue to be supplied to the ignition system.
- C) No, to turn off the ignition the magnetos operate on the principle of short-circuiting the current and a loose ground wire can allow a cylinder to fire.

309. S48 FEX

The purpose of shutting an engine down with the mixture control at the end of the flight is to

- A) prevent an accidental start.
- B) preclude liquid lock during subsequent starts.
- C) assure that there is no fuel in the intake system that could result in a fire.

310. T11 FEX

Power is increased by the turbines in a turbocompound engine by

- A) exhaust gas velocity powering blow-down turbines geared to the crankshaft.
- B) engine driven turbines compressing the fuel/air mixture after it leaves the carburetor to increase the manifold pressure.
- C) exhaust gas pressure driving power-recovery turbines which compress the air before it is mixed with metered fuel from the carburetor.

311. T30 FEX

What is BMEP?

- A) A computed value (not measured) of the average pressure that exists in the cylinder of an engine during the power stroke.
- B) The maximum power output which can be obtained from an engine when it is operated at a specified RPM and manifold pressure.
- C) The pressure of the fuel/air mixture in the intake manifold between the carburetor or internal supercharger and the intake valve.

312. S12 FEX

The indicated horsepower of a reciprocating engine is defined by the

- A) computed horsepower based on engine RPM and manifold pressure adjusted to sea level.
- B) power developed in the combustion chambers less computed friction losses within the engine.
- C) power developed in the combustion chambers without reference to friction losses within the engine.

313. S48 FEX

Backfiring is indicated by

- A) intermittent firing and low cylinder temperatures.
- B) engine roughness and a sudden increase in cylinder head temperatures.
- C) explosions from the exhaust system with torching or afterburning.

314. T12 FEX

What is the effect on the fuel/air mixture when flying from a cold to a warm area at a constant altitude without automatic mixture control?

- A) The engine is not capable of producing as much power due to the increase in air density.
- B) The engine is capable of producing more power due to a greater volume of air which is available due to heat expansion.
- C) The engine is not capable of producing as much power due to a decrease in air density which causes a richer mixture.

315. S48 FEX

Afterfiring is indicated by

- A) intermittent firing and low cylinder temperatures.
- B) engine roughness and a sudden increase in cylinder head temperatures.
- C) explosions from the exhaust system with torching or afterburning.

316. S54 FEX

(Refer to figure 11.) The propeller condition depicted is

- A) onspeed.
- B) overspeed.
- C) underspeed.

317. S54 FEX

The principle which operates a Hamilton-Standard Hydromatic propeller is oil pressure

- A) to decrease or increase the blade angle.
- B) to decrease the blade angle and counterweights to increase the blade angle.
- C) and centrifugal twisting moment to decrease the blade angle and, counterweights and springs to increase the blade angle.

318. S18 FEX

Increasing the throttle setting while taxiing with a reciprocating engine will result in

- A) a decrease in blade angle.
- B) an increase in blade angle.
- C) an increase in propeller RPM.

319. S54 FEX

The purpose of the propeller synchrophase system is to set

- A) all propellers at exactly the same RPM.
- B) the propeller blade angles for all propellers in the same relative position.
- C) the angular difference in the plane of rotation between the blades of the slave engines and the blades of the master.

320. S54 FEX

Feathering of a Hamilton-Standard Hydromatic propeller can be accomplished by

- A) pushing in the feather button.
- B) pulling the fire emergency control handle.
- C) moving the propeller control lever to the full aft position.

321. W12 FEX

Which factor has the effect of increasing V1 speed?

- A) Dry cold air.
- B) High takeoff gross weight.
- C) Slush or standing water on the runway.

322. T33 FEX

During flight with zero angle of attack, the pressure along the upper surface of the wing will be

- A) equal to atmospheric pressure.
- B) less than atmospheric pressure.
- C) greater than the pressure below the wing.

323. S33 FEX

Why will an engine produce more power on a dry day than on a humid day?

- A) Increased air density.
- B) Humidity increases the density.
- C) Because a molecule of water weighs more than a molecule of nitrogen or oxygen.

324. T31 FEX

(Refer to figure 26.) How much fuel remains after dumping under operating conditions No. 1?

- A) 4,540 pounds.
- B) 4,980 pounds.
- C) 5,100 pounds.

325. T31 FEX

(Refer to figures 20 and 21.) What is the takeoff power available under operating conditions No. 1?

- A) 3,710 shaft horsepower.
- B) 3,770 shaft horsepower.
- C) 4,000 shaft horsepower.

326. T31 FEX

(Refer to figures 18 and 19.) What is the minimum torque required for takeoff under operating conditions No. 1?

- A) 12,400 inch-pounds.
- B) 16,600 inch-pounds.
- C) 18,000 inch-pounds.

327. T31 FEX

(Refer to figure 27.) What is the total fuel burn under operating conditions No. 1?

- A) 12,800 pounds.
- B) 14,440 pounds.
- C) 22,160 pounds.

328. T66 FEX

What type of gas is released by a nickel-cadmium battery during charging?

- A) Toxic nickel hydroxide.

- B) Oxygen and explosive hydrogen.
- C) Highly combustible acetylene and oxygen.

329. T75 FEX

What is a purpose of electrical bonding jumpers?

- A) Prevent static electricity discharges between parts of the structure.
- B) Provide a high-resistance path for electrical equipment to reduce radio interference.
- C) Minimize electrolytic corrosion by connecting dissimilar metals to form an integral unit.

330. T75 FEX

What is the purpose of a fuse-type current limiter?

- A) Prevent overloads in low power circuits.
- B) Fast blow design prevents damage to sensitive circuits or equipment.
- C) Permit short periods of overload before the fuse link melts and breaks the circuit.

331. T45 FEX

The trimming devices on a particular airplane include trailing edge tabs on the rudder and ailerons. If the airplane is trimmed to a more nose right and right wing up position, the right aileron trim tab will move

- A) up, and the rudder tab will move to the left.
- B) up, and the rudder tab will move to the right.
- C) down, and the rudder tab will move to the left.

332. S17 FEX

Oil extracts the most heat from which turbine engine components?

- A) Turbine bearings.
- B) Compressor bearings.
- C) Accessory drive bearings.

333. S63 FEX

Which hydraulic operation normally uses a double-acting, balanced linear actuator?

- A) Brakes.
- B) Landing gear.
- C) Automatic pilot servo.

334. S26 FEX

When will the landing gear position warning system provide a warning in the cockpit?

- A) When the power levers are retarded and the gear is in transit.

- B) When the power levers are advanced and the speed brakes are not retracted.
- C) When one power lever is retarded below cruise and the gear is down and locked.

335. S79 FEX

Why are pneumatic starters used on most large turbine engines?

- A) Less weight.
- B) Simple design requires no clutch.
- C) Air starters are mechanically more reliable than electrical starters.

336. S46 FEX

How does compressor RPM affect the power output of a turbofan engine?

- A) Power increases linearly with an increase in compressor speed.
- B) Efficiency increases when compressor blade tips reach Mach 1 or slightly higher.
- C) Compressor aerodynamics cause a nonlinear increase in power relative to compressor speed.

337. S42 FEX

Which is the most effective extinguishing agent for use on an electrical fire?

- A) Carbon dioxide.
- B) Methyl bromide.
- C) Carbon tetrachloride (Halon 04).

338. D14 FEX

The air carrier must give instruction on such subjects as respiration, hypoxia, and decompression to each crewmember on pressurized airplanes operated above

- A) 10,000 feet.
- B) 12,000 feet.
- C) 25,000 feet.

339. D23 FEX

A crewmember certificate may be issued by the FAA to flight crewmembers on U.S. registered aircraft engaged in

- A) international air commerce.
- B) flight crewmember training only.
- C) supplemental air carrier operations.

340. D22 FEX

Among the required items of information on the dispatch release of a domestic air carrier is the

- A) minimum fuel supply.

- B) weight and balance data.
- C) name of the pilot in command.

341. B15 FEX

For what purpose may information obtained from cockpit voice recorders and flight data recorders not be used?

- A) Identifying malfunctions and irregularities in aircraft systems.
- B) Determining causes of accidents and occurrences under investigation by the National Transportation Safety Board (NTSB).
- C) Determining any certificate action or civil penalty arising out of an accident or occurrence.

342. D11 FEX

When a second megaphone is required, where will it be located?

- A) On the flight deck.
- B) At the forward end of the passenger compartment.
- C) At the most rearward location in the passenger compartment.

343. D11 FEX

Which airplanes must be equipped with flight recorders?

- A) Large airplanes certified for operations above FL 250 or is turbine-engine powered.
- B) Airplanes that carry more than 19 passengers.
- C) All airplanes operating under CFR parts 121 or 125.

344. D30 FEX

During what situation may an airplane requiring a flight engineer be operated under CFR part 91?

- A) Test flight.
- B) Cargo flight.
- C) Passenger flight without compensation.

345. M51 FEX

Which is an effect of ice, snow, or frost formation on an airplane?

- A) Increased stall speed.
- B) Increased pitch-down tendencies.
- C) Increased angle of attack for stalls.

346. I22 FEX

What is the relationship between altitudes when the altimeter setting is higher than standard while flying at 15,000 feet indicated altitude?

- A) Indicated altitude is higher than true altitude.

- B) Indicated altitude is lower than pressure altitude.
- C) Indicated altitude is higher than pressure altitude.

347. I22 FEX

If the OAT increases during a flight at a constant power and indicated altitude, the true airspeed will

- A) decrease and true altitude will decrease.
- B) increase and true altitude will decrease.
- C) increase and true altitude will increase.

348. H124 FEX

(Refer to figure 36.) What is the new CG after removing the weight under operating conditions No. 1?

- A) 25.3 percent.
- B) 27.8 percent.
- C) 31.1 percent.

349. H124 FEX

(Refer to figure 32.) What is the new CG after removing the weight under operating conditions No. 1?

- A) 21.8 percent.
- B) 22.4 percent.
- C) 28.8 percent.

350. H124 FEX

(Refer to figure 44.) What minimum weight of cargo must be shifted from the forward to the aft cargo location to bring the CG within limits under operating conditions No. 1?

- A) 750 pounds.
- B) 1,110 pounds.
- C) 1,230 pounds.

351. H124 FEX

(Refer to figure 48.) What minimum weight of cargo must be shifted from the forward to the aft cargo location to bring the CG within limits under operating conditions No. 1?

- A) 500 pounds.
- B) 2,372 pounds.
- C) 4,990 pounds.

352. W13 FEX

When will power applications cause the greatest change in airplane trim and stability?

- A) When on a power approach at low airspeeds.
- B) Operation at high gross weight and low airspeed.
- C) When power is applied simultaneously with a configuration change.

353. T33 FEX

What must happen to true airspeed to maintain the same angle of attack in level flight, when the air density changes?

- A) The airspeed must increase when the air density decreases.
- B) The airspeed must increase when the air density increases.
- C) The airspeed must decrease when the air density decreases.

354. W07 FEX

An airplane is flying at a constant altitude with a power setting which produces the maximum air miles per pound of fuel. To maintain the maximum air miles per pound of fuel as the weight of the fuel decreases the engine power setting should be

- A) decreased.
- B) increased.
- C) maintained.

355. W12 FEX

(Refer to figure 2.) Compute the V speeds for the following conditions.

Gross weight	250,000 lb
Pressure altitude	428 ft
OAT	+80 °F
Flaps	25°
Tailwind	5 kts
Airport	SEA RWY 34

- A) V1 118, VR 132, V2 145.
- B) V1 117, VR 133, V2 144.
- C) V1 121, VR 133, V2 144.

356. W12 FEX

(Refer to figure 2.) Compute the V speeds for the following conditions:

Gross weight	310,000 lb	
Pressure altitude	428 ft	
OAT	+96 °F	
Flaps	15°	95°
Headwind	15 kts	

Airport

SEA RWY 16

- A) V1 139, VR 157, V2 166.
- B) V1 143, VR 155, V2 166.
- C) V1 141, VR 156, V2 165.

357. S69 FEX

(Refer to figure 6.) The cabin pressure differential is 8.6 PSI and the airplane is flying at FL 340. What is the cabin pressure altitude?

- A) 4,200 feet.
- B) 4,800 feet.
- C) 5,010 feet.

358. T31 FEX

How many minutes of dump time would be required to reach maximum landing weight at touchdown under the following conditions?

Number of engines	3
Cruise weight	171,000 lb
Max. landing weight	142,500 lb
Average fuel flow during dumping and descent to touchdown	3,170 lb/hr/eng
Time from start dump to landing	19 min
Fuel dump rate	2,300 lb/min

- A) 7.7 minutes.
- B) 11.1 minutes.
- C) 12.4 minutes.

359. T31 FEX

(Refer to figure 3.) What is the approximate duration of the passenger oxygen system for the conditions shown?

Cabin altitude	15,000 ft
Passengers	120
Bottle pressure	1,500 PSI

- A) 19 minutes.
- B) 23 minutes.
- C) 25 minutes.

360. T31 FEX

(Refer to figure 3.) What is the approximate duration of the passenger oxygen system for the conditions shown?

Cabin altitude	19,000 ft
Passengers	55
Bottle pressure	1,300 PSI

A) 35 minutes.
B) 42 minutes.
C) 46 minutes.

361. M51 FEX

What is the lowest temperature that water droplets may remain in a liquid state?

A) 0 °C.
B) 0 °F.
C) -40 °C.

362. S31 FEX

When the cabin pressure regulator is operating in the differential mode, reference pressure is vented to the atmosphere by the

A) relief valve.
B) isobaric metering valve.
C) differential metering valve.

363. S31 FEX

Which component gives an indication of the rate of change in cabin altitude and what unit of measurement is used?

A) Pressure controller, PSI.
B) Cabin vertical-velocity indicator, PSI.
C) Cabin vertical-velocity indicator, feet per minute.

364. T49 FEX

Which type of oxygen system is the flight deck equipped with normally?

A) Constant-flow.
B) Phase dilution.
C) Diluter-demand.

365. T49 FEX

What type of oxygen system is used for passengers?

A) Demand.
B) Constant-flow.
C) Diluter-demand.

366. S27 FEX

How does a photoelectric smoke detector operate?

- A) A photoelectric smoke detector only warns when smoke is present.
- B) A photoelectric smoke detector measures the amount of smoke under a specific set of conditions.
- C) A photoelectric smoke detector measures the amount of light available under a specific set of conditions.

367. S27 FEX

From a standpoint of toxicity and corrosion hazard, which fire extinguishing agent is safest to use in turbojet airplanes?

- A) Carbon dioxide.
- B) Methyl bromide.
- C) Chlorobromomethane.

368. S53 FEX

On a built-in carbon dioxide fire extinguishing system, how is a thermal discharge detected?

- A) The thermal plug is missing from the side of the bottle.
- B) The red plastic disc in the thermal discharge line is missing.
- C) The yellow plastic disc in the thermal discharge line is discolored.

369. S82 FEX

When an airplane is equipped with a continuous-loop fire detection system, which is the most common cause of false fire warnings?

- A) Moisture in the system.
- B) Dents, kinks, or crushed sensors.
- C) Improper routing or clamping of detector loops.

370. S53 FEX

In some fire extinguishing systems, evidence that the system has been intentionally discharged is indicated by the absence of a

- A) red disc on the side of the fuselage.
- B) green disc on the side of the fuselage.
- C) yellow disc on the side of the fuselage.

371. S27 FEX

Which type of fire detector circuit can continue to function with either one open or one short in the detector loops?

- A) Continuous loop.

- B) Two-wire thermal switch.
- C) Single-wire thermal switch.

372. S55 FEX

The purpose of vortex generators mounted on the horizontal stabilizer is to

- A) decrease drag at high airspeeds.
- B) increase elevator effectiveness at high speeds.
- C) prevent flow separation over the elevator at very slow speeds.

373. T45 FEX

The purpose of a control tab is to

- A) move the flight controls in the event of manual reversion.
- B) reduce control forces by deflecting in the proper direction to move a primary flight control.
- C) prevent a control surface from moving to a full deflection position due to aerodynamic forces.

374. S46 FEX

The speed (RPM or percent) of the innermost compressor of a triple-spool turbofan engine is referred to as

- A) N_1 .
- B) N_2 .
- C) N_3 .

375. S73 FEX

(Refer to figure 9.) Combustion takes place in which location?

- A) Location 2.
- B) Location 4.
- C) Location 7.

376. S73 FEX

(Refer to figure 9.) The total-pressure (P_{t7}) probes are mounted in which location?

- A) Location 1.
- B) Location 3.
- C) Location 10.

377. T55 FEX

Which is a disadvantage of the one-step over the two-step process when deicing/anti-icing an airplane?

- A) It is more complicated.
- B) The holding time is increased.
- C) More fluid is used with the one-step method when large deposits of ice and snow must be flushed off airplane surfaces.

378. M08 FEX

On most airplanes, deicing of the

- A) fuselage should be from the bottom up to prevent thermal shock to windows which may result in cracking or crazing.
- B) tail surfaces should be from the trailing edge forward to reduce the possibility of flushing ice or snow deposits into the balance bays and cavities.
- C) wings should begin at the leading edge wingtip, sweeping in an aft and inboard direction to avoid increasing the snow load on outboard wing sections.

379. T55 FEX

What determines the viscosity of Type 1 deicing/anti-icing fluid?

- A) Temperature.
- B) Thickening agents.
- C) Dispensing equipment.

380. J23 FEX

Which frequency is preferred to declare an emergency to ATC?

- A) 121.5 Mhz VHF.
- B) 243.0 Mhz UHF.
- C) The one in use.

381. J23 FEX

Which transponder code means the airplane is being forced to a new destination?

- A) 7500.
- B) 7600.
- C) 7700.

382. S42 FEX

What identifies a fire extinguisher used for brake fires?

- A) A square with the letter B.
- B) A circle with the letter C.
- C) A star with the letter D.

383. S42 FEX

Which is the preferred method of extinguishing a brake fire on the ground?

- A) Spray with Halon 1301.
- B) Apply a dry powder extinguisher.
- C) Blanket the fire with Halon 1211.

384. A02 FEX

Which is a definition of V_2 speed?

- A) Takeoff safety speed.
- B) Minimum takeoff speed.
- C) Takeoff decision speed.

385. D14 FEX

What is the term for the training required for flight crewmembers who have qualified and served on a particular type airplane (e.g., Boeing 727-100) before they may serve in the same capacity on a particular variation of that airplane?

- A) Upgrade training.
- B) Transition training.
- C) Differences training.

386. D14 FEX

Which flight engineer applicants may complete the entire initial flight check in an approved simulator?

- A) Applicants who have completed at least one previous flight check in an airplane similar in type.
- B) Applicants who possess a commercial pilot certificate with instrument, category, and class ratings.
- C) Applicants who have flown more than 200 hours as a flight engineer in the aircraft over which the check is being conducted.

387. D20 FEX

The pilot in command has emergency authority to exclude people from the flight deck. Those who may be excluded from this area include

- A) any person, in the interest of safety.
- B) anyone except an FAA air carrier inspector.
- C) anyone except a Federal law enforcement officer who presents proper credentials.

388. D15 FEX

What are the minimum flight engineer operating experience requirements for turbojet-powered airplanes when common carriage is involved?

- A) Flight engineer duties performed for 12 hours under the supervision of a check airman.

- B) Flight engineer duties performed for 8 hours under the supervision of the pilot in command.
- C) Flight engineer duties performed for 10 hours under the supervision of a qualified flight engineer.

389. D18 FEX

What is the flight time limitation for flag operations that requires two pilots and at least one additional flight crewmember?

- A) 100 hours during any 30-day period.
- B) 300 hours during any 3 calendar months.
- C) 1,000 hours during any 12 calendar-month period.

390. D11 FEX

On airplanes requiring a third gyroscopic bank-and-pitch indicator, which is a requirement with regard to the instrument or system's operation?

- A) The power source must be manually selected to prevent an inadvertent failure during an automatic power transfer.
- B) The power source must provide reliable operation for 30 minutes after total failure of the electrical generating system.
- C) The power source must provide reliable operation for the duration of the flight after failure of the alternating current electrical system.

391. D11 FEX

Which factors must be recorded by the approved flight recorder?

- A) Airspeed, time, altitude, vertical acceleration, and heading.
- B) Time, true altitude, calibrated airspeed, vertical speed, and heading.
- C) Elapsed time, airspeed, altitude, vertical acceleration, and magnetic course.

392. D11 FEX

A flight crewmember must be able to don and use a quick-donning type oxygen mask within

- A) 5 seconds.
- B) 10 seconds.
- C) 15 seconds.

393. A31 FEX

Which is an eligibility requirement for the issuance of a flight engineer certificate?

- A) Be a high school graduate or equivalent.
- B) Hold a first- or second-class medical certificate.
- C) Read, understand, and speak the English language without impediment or accent.

394. I29 FEX

Why is frost considered a flight hazard?

- A) Frost changes the basic aerodynamic shape of the airfoil.
- B) The increased weight requires a greater takeoff distance.
- C) Frost causes early airflow separation resulting in a loss of lift.

395. I20 FEX

Which is true concerning the troposphere?

- A) It extends to a uniform height at all latitudes.
- B) It is thicker over the Equator than over the poles.
- C) It is the dividing line between the stratosphere and the atmosphere.

396. T33 FEX

What atmospheric condition will decrease air density?

- A) Decreasing humidity.
- B) Decreasing pressure.
- C) Decreasing temperature.

397. J26 FEX

What will be the approximate altimeter indication after failing to reset the local barometric pressure of 30.57 after descending from FL 250 to a field elevation of 650 feet?

- A) Sea level.
- B) 715 feet.
- C) 1,300 feet.

398. I22 FEX

Under what condition is pressure altitude and density altitude the same value?

- A) At standard temperature.
- B) When the altimeter setting is 29.92 inches Hg.
- C) When indicated and pressure altitudes are the same value on the altimeter.

399. H111 FEX

The CG of an airplane is normally located in the fuselage at a point expressed in

- A) inches from the forward CG limit.
- B) percent of mean aerodynamic chord aft of LEMAC.
- C) percentage of MAC aft of the leading edge of the wing.

400. H111 FEX

The term mean aerodynamic chord may be defined as the

- A) ratio of the average wing chord to its aerodynamic center of pressure.
- B) distance from the leading edge to the trailing edge of the wing, measured at the wing root.
- C) chord of an imaginary airfoil which has the same aerodynamic characteristics as the actual airfoil.

401. H126 FEX

What is the maximum payload under these conditions?

Basic operating weight	100,500 lb
Max. zero fuel weight	138,000 lb
Max. landing weight	142,000 lb
Max. takeoff weight	184,200 lb
Fuel tank load	54,000 lb
Est. fuel burn en route	40,000 lb

- A) 27,500 pounds.
- B) 30,500 pounds.
- C) 33,000 pounds.

402. H126 FEX

What is the maximum payload under these conditions?

Basic operating weight	150,000 lb
Max. zero fuel weight	230,000 lb
Max. landing weight	245,000 lb
Max. takeoff weight	320,000 lb
Fuel tank load	94,500 lb
Est. fuel burn en route	71,500 lb

- A) 72,000 pounds.
- B) 80,000 pounds.
- C) 84,000 pounds.

403. H124 FEX

What is the location of the CG if 1,460 pounds are removed from Station 1500?

Aircraft weight	171,520 lb
CG location	Station 820

- A) 814.17 inches.
- B) 850.49 inches.
- C) 1,000.6 inches.

404. H105 FEX

Based on this information, where would the CG be located?

Weight No. 1	601 lb at 45 in. aft of datum
Weight No. 2	700 lb at 145 in. aft of datum
Weight No. 3	125 lb at 185 in. aft of datum

- A) 100.06 inches aft of datum.
- B) 106.36 inches aft of datum.
- C) 116.26 inches aft of datum.

405.	H124	FEX
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May 1,000 pounds of baggage be shifted from Station 30.0 to Station 120.0 without exceeding the aft CG limit?

Total weight	147,500 lb
CG location	Station 115.8
Aft CG limit	Station 118.0

- A) Yes, the CG would be located at Station 115.19.
- B) No, the new CG would be located at Station 118.41.
- C) Yes, the new CG would be located at Station 116.41.